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wide apart; some are long, either oval or pointed at one end, seldom pointed however, while others are much rounded. The difference in size and shape of eggs in one set is occasionally commentable and the style of marking may be odd, also the ground color, while very rarely all these characteristics present themselves in a set of four eggs.

Four eggs is the average number to a set, often three, and only twice have I found five eggs. I have taken two sets of two eggs each, all much below medium size; three eggs were well incubated and the fourth was infertile. In early numbers of the *Nidologist* I referred to having found sets of unusually small eggs, and individual birds laying successive sets of such eggs. The only abnormally large egg I found was among a set of three eggs. One nest of four very small eggs contained two that were infertile, two heavily incubated and two of the California Partridge, heavily incubated.

The nests bear a great similarity in material used. The general composition is a lot of dry leaves for a foundation or for a lining over the earth, strips of bark, stalks of weeds, coarse dry grass, occasionally a few shavings and rubbish that can be worked into the foundation and rim. The lining is the least variable, being neatly laid, rather crosswise, and consists of a certain kind of fine, bright, dry grass which is almost all stem. Occasionally there is a little less of this grass when long hair is substituted, but this they seem unable to place so neatly as the California Towhee. A nest under an oak in the

center of a large grain field was composed of a few pieces of weed stems, the balance and the lining of short, rather coarse black rootlets, the wild grass in this case being probably too far distant for birds of short flight to carry. A nest built near a pile of dead cypress branches was composed chiefly of strips of bark from the branches. Other nests whenever found under pine trees are invariably lined totally with dry pine needles, the birds evidently preferring this pliant material of suitable length to the kind of grass usually used and growing close by.

The young when first hatched are black with yellow gapes and covered with thin greyish-white down. The incubating bird sets close and the nest is usually found by flushing the bird which at times flushes at the sound of approach fifty feet away, always betraying the location by rising high enough into the air to be detected, though occasionally slipping away through cover to a short distance, only to make a fuss and cause a search for the nest. At times the bird hops along a few feet before rising.

Some years ago, one winter, I beheld an Oregon Towhee on top of a leafless apple tree truthfully imitating the California Jay's commonest notes, very different from its own. From my close point of observation I could detect the movements of its throat and bill and determine that none other than the object of my gaze was for the time being the "mockingbird", the only one of its kind I have had the fortune to hear.

Summer Resident Warblers of Arizona.

BY O. W. HOWARD, LOS ANGELES, CAL.

[Read before the Southern Division of the Cooper Orn. Club, Feb. 25, 1899.]

VIRGINIA'S WARBLER.

(Concluded.)

This species is quite common in the pine regions throughout Arizona, but I have not seen it at a lower elevation than 5000 feet. Unlike other warblers in this section, they keep almost entirely in the underbrush, where they are continually on the move and at the same time uttering a quick chirp as if in distress. Owing to the dull plumage

and retiring habits of this bird comparatively few are seen. The nests are placed on the ground, under a bush or tuft of grass and are made of fine straws, rootlets and fibres, loosely put together. Except when the birds have young, they are very shy about going to the nest, and for this reason few nests are found with eggs while more are found containing young birds.

On our trip in 1896, Mr. W. B. Judson found a nest containing four fresh eggs on the 17th day of May. It was placed on a side hill under a tuft of grass at an elevation of about 7000 feet. On June 1, Mr. Judson found another nest in the same locality and after watching the bird for fully a half hour she went to the nest which was placed on the edge of a bluff in a bunch of grass, under some pines. After seeing the bird go to where we supposed the nest was situated we made a careful search and nearly stepped on it several times when Mr. Judson finally found it. This nest

contained four eggs well advanced in incubation. The eggs are of a dull white color, finely speckled over the entire surface with brown and cinnamon. The nests of the bird, like those of other ground-nesting birds of this locality, are destroyed by jays and snakes. The jays steal both eggs and young. Often a whole band of these winged wolves will sweep down on a nest and in less time than it takes to tell it they will devour the contents and destroy the nest, the pitiful notes of the helpless parents being drowned by the harsh notes of the marauders.

AUDUBON'S WARBLER.

Audubon's Warbler is quite scarce during the summer months, as only a few of them remain to breed. Like the Olive, they are found high up in the pines along the tops of the ridges. I found several nests in 1897 and 1898 in Huachuca Mountains. The nests are very loosely constructed, being composed almost entirely of loose straws with a few feathers and hair for a lining. The eggs, generally four in number, are of a dull white ground color with light brown spots and blotches and under shell markings of a dull lavender. One nest containing four slightly incubated eggs, found on June 14, 1898, was placed in a red fir tree about fifteen feet up, which is unusually low for this species.

Another nest taken June 22, 1898, was placed in the lower branches of a sugar-pine about fifty feet from the ground, and twelve feet out from the trunk of the tree. This nest, like many others, could be taken only by using a long rope which I always carry with me. One end of the rope is drawn up into the tree by means of a cord and is passed around the trunk over a limb diagonally above the nest; the rope is then pulled around until both ends meet on the ground, thus making a double rope. The party on the ground

then walks out with the rope until it reaches a point within a foot or two of the nest and holds it as tight as possible so that the rope is quite often at an angle of 45°. The party up the tree then twists the rope around one leg and slides down to a point even with the nest where he hangs on with one hand and with the other takes the eggs from the nest, one by one, and places them in his mouth. This seems to take half an hour but probably takes a half-minute. The next thing in order is to cut the end of the limb off with the nest. This is done with a small hatchet carried in the belt and is the most aggravating job I know of; it is something like playing golf. You strike at the air three times to every time you hit the limb and the worst of it all is that you cannot swear because you have your mouth full of eggs. When the limb is nearly severed you put your hatchet back in your belt or drop it on the rocks below to keep it sharp. Then you pull the limb off and hold it in one hand while you slide down the rope to the ground, where you find a shady place and lie down while the other fellow pulls the rope down. Three or four innings like this every day will give you a fine appetite for supper. If you don't believe me, try it!

BLACK-THROATED GRAY WARBLER.

These birds are very plentiful during the breeding season in the mountains of Southern Arizona. They may be found from an altitude of 4000 to 9000 feet, but are more common in the oak

belt, from 4000 to 7000 feet altitude, where a great many of them breed. Nevertheless, comparatively few nests are found. I believe the reason for this is, because unlike other warblers, these

birds do not have a note of alarm nor do they show any signs of breeding, and unless you see them carrying building material one might as well give up watching them for they could keep you busy all day doing nothing else. The birds are constantly on the jump, apparently catching insects. Even when flushed from the nest they will hop about in their usual unconcerned manner. Many nests are placed in the dense thickets of scrub oak which abound in this section. They are placed in the forks of the larger limbs quite often within reach of the ground, while other nests are placed high up in pines. The nests are very compact, of a deep cup shape, much like those of the Yellow Warbler. The nesting material varies according to the locality.

PAINTED REDSTART.

One of the prettiest of all our warblers. The markings of red, white and black are very clear and the birds seem to take great pride in showing off their colors. With their wings partly open and tail spread they may be seen hopping about on mossy banks or stumps of large trees, generally in the vicinity of a spring or waterfall; now and then they will fly up to catch some insect, much after the manner of the flycatcher. Breeding commences early in April and lasts until June. I found two nests just completed on April 11, 1897 in the Santa Catalina Mountains, near Tucson, Ariz., and also found a set of fresh eggs on June 1, 1896 in the Huachuca Mts.

The nests are usually placed on slop-

From a nest found May 20, 1896. I secured a fine set of four fresh eggs. This nest was placed in an oak sapling, in an upright fork about ten feet from the ground. I visited two other nests the same day. These were placed in similar situations. I had found the birds building these some time before and expected to procure a fine set of eggs from each, but to my disappointment both nests had been destroyed, the work, undoubtedly, of Arizona Jays. I found other nests, some placed in large white oaks and some in sycamores and have known the birds to build high up in pines. The eggs are dull white, speckled and blotched with grayish-brown. There is great variation in the color and size, even in eggs of the same set.

ing ground under a projecting rock or bunch of grass and, as a rule, in the vicinity of a spring or waterfall where there is a rank growth of ferns or grass. These nests are loosely constructed as a rule but sometimes are quite compact and are composed of fine straws, vegetable fibres and leaves, with a lining of fine grass and hair. The nests I found were between 5000 and 8000 feet elevation. The eggs are more nearly oval in shape than most other warblers' and are slightly larger than the average. They are pure white, speckled with markings of cinnamon and lavender over the entire shell, but more heavily at the larger end, sometimes forming a wreath.

RED-FACED WARBLER.

These birds are quite common in the mountains of Southern Arizona, especially during the spring migration. I have seen as many as four or five feeding in one tree. They become scarcer as the season advances and at the time of breeding comparatively few of them remain. The nests are placed on the ground under a bunch of grass or near a fallen log, where leaves have drifted. It would be impossible to find them without watching the birds and even then one must be very quiet and keep out of sight as much as possible, for the birds seem to realize the danger of go-

ing to the nest.

I found my first nest on May 18, 1896 at an elevation of about 7000 feet. It was placed on a side hill under a tuft of grass. The composition was mostly of fine straws with a few leaves for lining. This nest contained four perfectly fresh eggs, pure white in color, marked with fine specks and blotches over the entire shell, and more thickly at the larger end. There is quite a variation in the eggs, both in size and marking. The other nests I examined were placed in similar situations and the full sets were invariably of four eggs each.